



Selection criteria for the priority list of the 25 technologies and products to be translated of Practice Abstracts to 8 languages

Target for selection of the priority list:

The NUTRIMAN is summarising, sharing and presenting large number of advanced innovative N/P recovery technologies/products “ready for practice” (TRL \geq 6), which are interactive highlighted on the NUTRIMAN Farmer Platform (<https://nutriman.net/farmer-platform>) web page in English language. All in order to increase awareness at farmers and spread the knowledge/information about the insufficiently exploited N/P recovery innovations, NUTRIMAN is selecting priority list of selected 25 ready to market available technologies/products to be translated into partner’s native (8) languages and disseminate them through a multilingual Farmer web Platform.

Who will select?

While all the N/P recovery technologies/products on the Farmer Platform web are advanced, still there is a criterion we apply to select the priority list of 25 for translation that is performed by combining the criteria, ranked by the [FAB \(Farmers Advisory Board\)](#) and the information assessed by the expert partners of the [NUTRIMAN consortium](#) (Table 1.).

Table 1. Expert partners from the NUTRIMAN consortium assigned to technology and product categories

Technology categories and assigned expert partners	Product categories and assigned expert partners
1. Thermochemical nutrient recovery (P1 3R, Biochar and Bio-Phosphate) (P11 FehS, ash)	1.a. Biochar and Bio-Phosphate (>TRL7 industrial: P1 3R) (<TRL7 research: P6 INAGRO, P6.2 ILVO) 1.b. Ash (P11 FEhS)
2. P-precipitation from liquid manure, waste water and drain water (P13 DAM, P9 CARTIF, P6 INAGRO)	2. Struvite and other P-precipitates (P13 DAM, P9 CARTIF)
3. Physic-chemical nitrogen recovery from manure, digestate and wastewaters: separation, stripping and membrane processes (P5 UGent, P6 INAGRO, P9 CARTIF).	3. Scrubber waters & mineral nitrogen concentrates (P5 UGent, P6 INAGRO)
4. Biological nutrient recovery: composting, anaerobic digestion (P10 UNITO, P8 VLACO) (P12 IUNG)	4. Compost and Digestate (incl. derivatives) (P10 UNITO, P8 VLACO, P6 INAGRO) (P12 IUNG)

How to select?

The expert partners from the NUTRIMAN consortium together with the FAB members are evaluating available input info documentations/data and based on the measurable performances for five criteria (Table 2.), selecting the priority list of technologies and products (in total 25), which are representative for each category sections. Additionally we encourage all vendors to submit any multilingual and more detailed practical info related to its own technologies/products, that NUTRIMAN is directly and “as received” linking to Farmer Platform web page.



Table 2: Criteria for revision of longlist

Criteria for revision of longlist	
Technologies	Products
<p>1. Technology maturity and readiness level from successfully completed TRL\geq6.</p> <ul style="list-style-type: none"> • Applicable at farm level • Preferably demonstrated in agricultural practice. • If not, product can still be good, but choice of technology and production by another producer not by the farmer 	<p>1. Nutrient quality/efficiency, demonstrated in agricultural practice (proof of fertilizing value for agriculture)</p> <ul style="list-style-type: none"> • Effectiveness in fields • Fertilizer replacement value • Recommended by third parties (eg. Chamber of Agriculture) • Known and homogeneous nutrient (macro-, micro-, trace-elements) content and concentration • Based of harmonized or otherwise accepted research/analytical standards
<p>2. Processing conditions proven effectiveness to convert crude input material into safe and high quality fertilizing products.</p> <ul style="list-style-type: none"> • Based on input material risk assessment of: <ul style="list-style-type: none"> ○ bio-hazards, pathogens ○ heavy metals, pollutants ○ contaminants, foreign substances ○ environmental/climate pollution ○ social acceptance • Important to determine applicable production and process legislation requirements • Capacity to handle sufficient input volumes 	<p>2. Input material</p> <ul style="list-style-type: none"> • Origin of raw material must be known to perform input material risk assessment of: <ul style="list-style-type: none"> ○ bio-hazards, pathogens ○ PTEs, pollutants ○ contaminants, foreign substances ○ environmental pollution ○ climate impacts ○ social and market acceptance • Important to determine applicable product and application legislation • Availability in region and fertilization period
<p>3. CAPEX and OPEX: production costs euro/ton</p> <ul style="list-style-type: none"> • On commercial scale • Use of energy and other resources • Labour requirements • Production costs compared with alternative costs for disposal 	<p>3. Product price EXW wholesale: euro/kg N; euro/kg P₂O₅</p> <ul style="list-style-type: none"> • Fertilizer replacement value • The lower the nutrient density the lower the price • Total costs including transport, storage and application
<p>4. Legal status (regional/MS national/EU)</p> <ul style="list-style-type: none"> • MS Authority permit available • Regional permit requirements from local authorities • In conformity with process requirements in: <ul style="list-style-type: none"> ○ All relevant industrial, environmental, climate and safety norms and EU harmonized MS regulations ○ Animal Byproduct Regulation (EC/1069/2009) ○ New Circular Economy and New Green Deal • Best available technique listing status 	<p>4. Legal status (MS national/EU)</p> <ul style="list-style-type: none"> • Product definition/classification according to: <ul style="list-style-type: none"> ○ Animal Byproduct Regulation (EC/1069/2009) ○ Fertilising Product Regulation (EU/1009/2019) ○ Nitrates Directive (91/676/EEC) ○ Waste Directive (2008/98/EC) • Regulation and application limits • Allowed for certified organic farming yes/no • Product environmental performance (N leaching, emissions, GHG emissions, heavy metals, other contaminants)



Criteria for revision of longlist	
Technologies	Products
<p>5. Output material:</p> <ul style="list-style-type: none"> • The technology output is: <ul style="list-style-type: none"> ○ Component material, for further processing ○ Final end product • Homogenous • Biological, chemical, physical stabile • Which by-products will be produced 	<p>5. Output material:</p> <ul style="list-style-type: none"> • Type of end product • Product form (solid, fluid, grained, pilled, pelletized, meal, dust, spreadable goods) • Practical applicability, spreading, distribution, dosage. • Application method/form, machinery requirements • Homogenous • Biological, chemical, physical stabile

